Volunteer Lake Assessment Program Individual Lake Reports

PAWTUCKAWAY LAKE, NOTTINGHAM, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	13,248	**Max. Depth (m):**	15.2	**Flushing Rate (yr^{-1}):**	2.3
Surface Area (Ac.):	900	**Mean Depth (m):**	2.9	**P Retention Coef:**	0.61
Shore Length (m):	27,700	**Volume (m^3):**	10,740,000	**Elevation (ft):**	250

TROPHIC CLASSIFICATION

Year	Trophic class
1989	MESOTROPHIC
1998	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

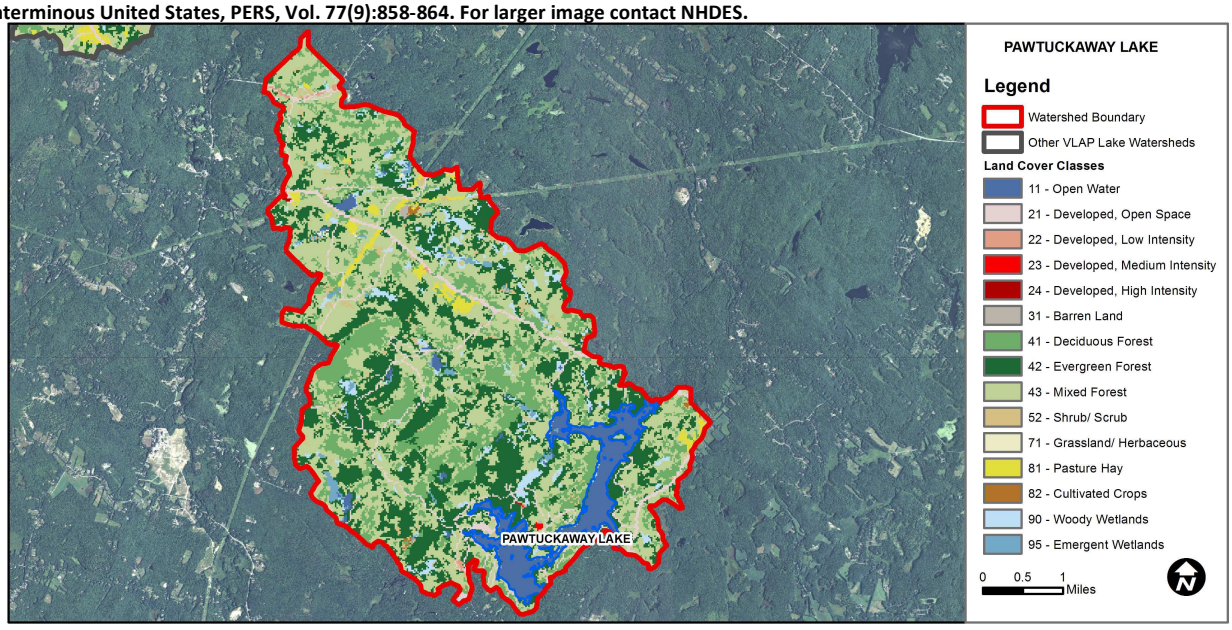
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Good	At least 10 samples with 1 sample but < 10% of samples exceeding criteria.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	No Data	No Data for this parameter.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Good	At least 10 samples with 1 sample but < 10% of samples exceeding criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

PAWTUCKAWAY LAKE - TOWN BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.
PAWTUCKAWAY LAKE - PAWTUCKAWAY STATE PARK BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.
PAWTUCKAWAY LAKE - PAWTUCKAWAY STATE PARK BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



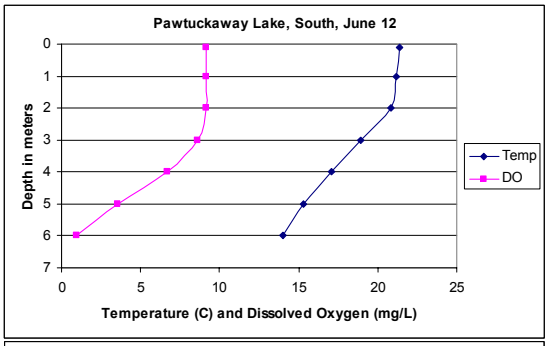
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	6.52	Barren Land	0.09	Grassland/Herbaceous	0.06
Developed-Open Space	4.12	Deciduous Forest	16.26	Pasture Hay	1.5
Developed-Low Intensity	0.19	Evergreen Forest	26.59	Cultivated Crops	0.16
Developed-Medium Intensity	0.05	Mixed Forest	38.87	Woody Wetlands	3.15
Developed-High Intensity	0.02	Shrub-Scrub	1.49	Emergent Wetlands	0.92

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
PAWTUCKAWAY LAKE, SOUTH STN, NOTTINGHAM, NH
2012 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic)*

- **CHLOROPHYLL-A:** Chlorophyll levels spiked in September and were generally greater than the NH lake median. Historical trend analysis indicates chlorophyll levels tend to fluctuate from year to year.
- **CONDUCTIVITY/CHLORIDE:** Conductivity levels were slightly greater than the NH lake median.
- **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer) phosphorus levels were greater than the NH lake median and increased from 2011. Historical trend analysis indicates epilimnetic phosphorus tend to fluctuate from year to year. Hypolimnetic phosphorus levels remained relatively stable throughout the summer. Mountain Bk. phosphorus was elevated in July and September and sediment was noted in samples.
- **TRANSPARENCY:** Transparency was approximately equal to the NH lake median. Volunteers switched to utilizing only the viewscope method to measure transparency (2007-2012); therefore we need at least ten consecutive years of data to conduct a statistical trend analysis of viewscope transparency data.
- **TURBIDITY:** Hypolimnetic turbidity was slightly elevated in July, August and September potentially due to disturbed bottom sediments and/or natural processes. Mountain Bk. turbidity was elevated in July and September likely due to sediment from low flow conditions.
- **PH:** pH levels decreased to lower than desirable in the Hypolimnion.
- **RECOMMENDED ACTIONS:** Phosphorus levels are slightly above average and efforts should be made to reduce phosphorus loading from the surrounding watershed. Educate watershed residents on ways to reduce phosphorus loading from their properties through do it yourself stormwater management projects. Keep up the great work!

Dissolved Oxygen & Temperature Profile



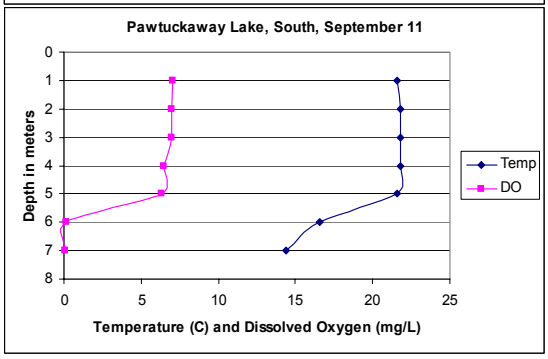
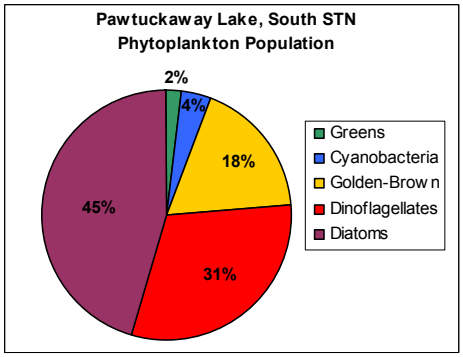


Table 1. 2012 Average Water Quality Data for PAWTUCKAWAY LAKE, SOUTH

Station Name	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
South Epilimnion	6.4	5.14	47.0	16	3.10	3.36	1.21	6.87
South Hypolimnion			50.0	19			3.10	6.25
Mountain Brook			48.4	41			2.80	6.32

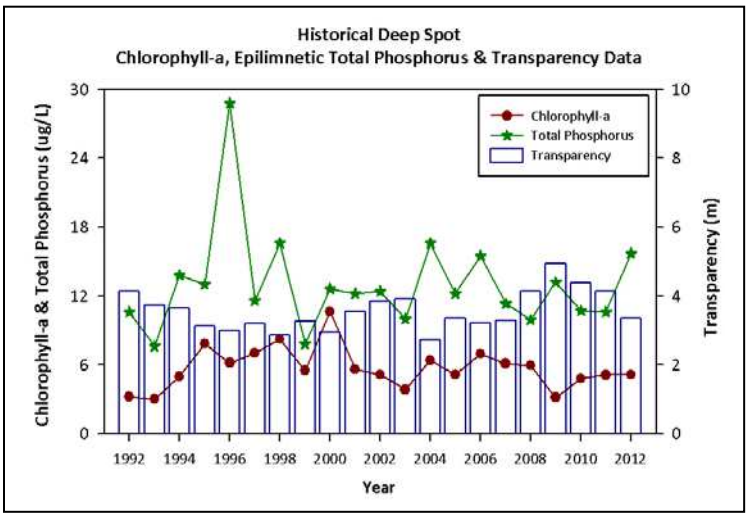


NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.
Transparency	N/A	Additional viewscope data necessary to determine trend.
Phosphorus (epilimnion)	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.



This report was generated by the NH DES Volunteer Lake Assessment Program (VLAP). For more information contact:
Sara Steiner
PO Box 95
Concord, NH 03302-0095
(603) 271-2658
sara.steiner@des.nh.gov